

CORRESPONDENCE/MEMORANDUM**State of Wisconsin**

DATE: June 26, 2020

TO: Lisa Lumley – NER

FROM: Wade Strickland – WY/3

SUBJECT: Water Quality-Based Effluent Limitations for the Green Lake Wastewater Treatment Facility
WPDES Permit No. WI-0021776-09

This is in response to your request for an evaluation of the need for water quality-based effluent limitations (WQBELs) using Chapters NR 102, 104, 105, 106, 207, 210, 212, and 217 of the Wisconsin Administrative Code (where applicable), for the discharge from the Green Lake Wastewater Treatment Facility in Green Lake County. This municipal wastewater treatment facility (WWTF) discharges to the Puchyan River, located in the Upper Fox Watershed in the Upper Fox and Wolf River Basin. This discharge is included in the Upper Fox and Wolf Basins TMDL as approved by EPA. The evaluation of the permit recommendations is discussed in more detail in the attached report.

Based on our review, the following recommendations are made on a chemical-specific basis at Outfall 001:

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1,2
BOD ₅			45 mg/L	30 mg/L		1
TSS			45 mg/L 175 lbs/day	30 mg/L 118 lbs/day		3
pH	9.0 s.u.	6.0 s.u.				1
Ammonia Nitrogen						1,2
Bacteria						4
Interim Limit Fecal Coliform				400 #/100 mL geometric mean		
Final Limit <i>E. coli</i>				126 #/100 mL geometric mean		
Phosphorus LCA Interim Limit HAC Interim Limit Final WQBEL				1.0 mg/L 0.8 mg/L 2.61 lbs/day	0.869 lbs/day	3,5
Nitrite + Nitrate						2,6
Nitrogen, Total Kjeldahl						2,6
Total Nitrogen						2,6

Footnotes:

1. No changes from the current permit.
2. Monitoring only.
3. The TSS and phosphorus mass limits are based on the Total Maximum Daily Load (TMDL) for the Upper Fox and Wolf River Basin to address water quality impairments within the TMDL area. The TMDL was approved by EPA March 2020.
4. Limits apply during the disinfection season of May through September. The fecal coliform interim limit will apply until the end of the compliance schedule when *E. coli* limits take effect.

Additional final limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.

5. Under the phosphorus MDV, a level currently achievable (LCA) interim limit of 1.0 mg/L should be effective upon permit reissuance. A compliance schedule may be included in the permit until the highest attainable condition (HAC) limit of 0.8 mg/L can be met. The final TMDL-derived limits are 2.61 lbs/day as a monthly average and 0.869 lbs/day as a six-month average.
6. As recommended in the Department's October 1, 2019 Guidance for Total Nitrogen Monitoring in Wastewater Permits, annual total nitrogen (total kjeldahl nitrogen and nitrate/nitrite) monitoring is recommended for all minor municipal permittees. Total Nitrogen is the sum of nitrate (NO₃), nitrite (NO₂), and total kjeldahl nitrogen (all expressed as N).

The recommended limits meet the expression of limits requirements in ss. NR 106.07 and NR 205.065(7) and additional limits are not required.

Following the October 29, 2019 Department's WET Program Guidance Document, no WET testing is required.

Please consult the attached report for details regarding the above recommendations. If there are any questions or comments, please contact Nicole Krueger at Nicole.Krueger@wisconsin.gov or Diane Figiel at Diane.Figiel@wisconsin.gov.

Attachments (3) – Narrative, Thermal Table, and Outfall Map

PREPARED BY: Nicole Krueger, Water Resources Engineer – SER

APPROVED BY: _____ Date: _____
Diane Figiel, PE,
Water Resources Engineer

E-cc: Mark Stanek, Wastewater Engineer – NER
Heidi Schmitt Marquez, Regional Wastewater Supervisor – NER
Diane Figiel, Water Resources Engineer – WY/3

Water Quality-Based Effluent Limitations for the Green Lake Wastewater Treatment Facility

WPDES Permit No. WI-0021776-09

Prepared by: Nicole Krueger

PART 1 – BACKGROUND INFORMATION

Facility Description:

The City of Green Lake wastewater treatment facility (WWTF) was put into operation during 2008. Raw wastewater first passes through fine screens and grit removal. The wastewater then flows through two rectangular sequencing batch reactors or two ICEAS (Intermittent Cycle Extended Activated Sludge) basins that are operated in parallel. Each basin has pre-react zones that are operated both aerobically and anoxic/anaerobically in conjunction with the rest of the ICEAS basin to promote biological phosphorus removal. Ferric chloride is added to the ICEAS basins as needed to meet phosphorus limits. The basins have a decant weir that allows discharge during the settling cycle. This effluent passes through UV disinfection prior to discharge to the Puchyan River. Biosolids are aerobically digested and dewatered using a belt press, and the biosolids cake is stored in a covered building. Hauled wastes are accepted and stored in a tank, and then metered into the treatment system.

Attachment #2 is a map of the area showing the approximate location of Outfall 001.

Existing Permit Limitations: The current permit, expiring on 06/30/2020, includes the following effluent limitations and monitoring requirements.

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1
BOD ₅			45 mg/L	30 mg/L		2
TSS			45 mg/L	30 mg/L		
pH	9.0 s.u.	6.0 s.u.				2
Ammonia Nitrogen						1
Fecal Coliform May – September				400#/100 mL geometric mean		
Phosphorus Interim				1.0 mg/L		3

Footnotes:

1. Monitor only.
2. These limitations are not being evaluated as part of this review. Because the water quality criteria (WQC), reference effluent flow rates, and receiving water characteristics have not changed, limitations for these water quality characteristics do not need to be re-evaluated at this time.
3. This is an interim limit. The final WQBELs are listed in the table below are included in the permit with a compliance schedule to meet the limits by 06/30/2024.

Attachment #1

Month	Monthly Average Limit (mg/L)
January	0.70
February	0.97
March	1.0
April	1.0
May	1.0
June	1.0
July	0.84
August	0.65
September	0.51
October	0.46
November	0.51
December	0.56

Receiving Water Information:

- Name: Puchyan River
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Warm water sport fish community, non-public water supply.
- Low Flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code: The following 7-Q₁₀ and 7-Q₂ values are from USGS for Station UF22, where Outfall 001 is located.

7-Q₁₀ = 4.4 cfs (cubic feet per second)

7-Q₂ = 10 cfs

90-Q₁₀ = 8.5 cfs

Harmonic Mean Flow = 22.5 cfs using a drainage area of 104 mi²

The Harmonic Mean has been estimated based on average flow and the 7-Q₁₀ using an equation from U.S. EPA's *Technical Support Document for Water Quality-Based Toxics Control* (March 1991, EPA/505/2-90-001, pgs. 88-89).

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
7-Q ₁₀ (cfs)	12	16	17	19	44	26	10	9.3	6.9	6.3	6.3	9.0
7-Q ₂ (cfs)	23	33	50	65	71	53	28	21	16	14	16	18

- Hardness = 231 mg/L as CaCO₃. This value represents the geometric mean of data from WET tests from 04/21/1998 to 07/23/2013.
- % of low flow used to calculate limits in accordance with s. NR 106.06 (4) (c) 5., Wis. Adm. Code: 25%
- Source of background concentration data: Metals data from the Fox River in Brown County are used for this evaluation because there is no data available for the Puchyan River. Chloride data from the Grand River near Kingston is also used in this evaluation. The Fox River is within the same ecological landscape so ambient water quality characteristics are expected to be similar. The numerical values are shown in the tables below. If no data is available, the background concentration is assumed to be negligible and a value of zero is used in the computations. Background data for calculating effluent limitations for ammonia nitrogen are described later.
- Multiple dischargers: None
- Impaired water status: The Puchyan River at the outfall location is not impaired. The Puchyan River approximately ¾ mile downstream of the outfall is listed as impaired for elevated temperature.

Effluent Information:

- Design Flow Rate(s):
Annual average = 0.5 MGD (Million Gallons per Day)
For reference, the actual average flow from 07/01/2015 to 12/31/2019 was 0.19 MGD.
- Hardness = 397 mg/L as CaCO₃. This value represents the geometric mean of data from the permit reissuance application from 11/23/2019 to 12/02/2019.
- Acute dilution factor used in accordance with s. NR 106.06 (3) (c), Wis. Adm. Code: Not applicable – this facility does not have an approved Zone of Initial Dilution (ZID).
- Water Source: Domestic wastewater with water supply from wells.
- Additives: Ferric chloride is added for phosphorus removal.
- Effluent characterization: This facility is categorized as a minor municipality, so the permit application required effluent sample analyses for a limited number of common pollutants, as specified in s. NR 200.065, Table 1, Wis. Adm. Code, primarily metal substances plus Ammonia, Chloride, Hardness and Phosphorus.

Sample Date	Copper µg/L	Sample Date	Copper µg/L	Sample Date	Copper µg/L
11/23/2019	12	12/05/2019	2.5	12/17/2019	3.8
11/26/2019	5.0	12/08/2019	3.6	12/20/2019	4.1
11/29/2019	4.9	12/11/2019	1.9	12/23/2019	3.6
12/02/2019	4.3	12/14/2019	2.8		
1-day P ₉₉ = 14 µg/L					
4-day P ₉₉ = 8.4 µg/L					

Sample Date	Chloride
11/23/2019	300
11/26/2019	260
11/29/2019	210
12/02/2019	220
Average	248

The permit reissuance application included only four chloride samples, so data from previous permit terms were used for this evaluation. The following table is a summary of data from 01/09/2004 to 12/02/2019.

	Chloride mg/L
1-day P ₉₉	673
4-day P ₉₉	519
30-day P ₉₉	436
Mean	392
Std	97.5
Sample size	23
Range	210 – 620

Effluent data for substances for which a single sample was analyzed is shown in the tables in Part 2 below, in the column titled “MEAN EFFL. CONC.”.

Attachment #1

The following table presents the average concentrations and loadings at Outfall 001 from 07/01/2015 to 12/31/2019 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6):

	Average Measurement
BOD ₅	3.17 mg/L*
TSS	2.18 mg/L*
pH field	7.56 s.u.
Phosphorus	0.75 mg/L
Ammonia Nitrogen	0.41 mg/L*
Fecal Coliform	26.3 #/100mL

*Results below the level of detection (LOD) were included as zeroes in calculation of average.

PART 2 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR TOXIC SUBSTANCES – EXCEPT AMMONIA NITROGEN

Permit limits for toxic substances are required whenever any of the following occur:

1. The maximum effluent concentration exceeds the calculated limit (s. NR 106.05(3), Wis. Adm. Code)
2. If 11 or more detected results are available in the effluent, the upper 99th percentile (or P₉₉) value exceeds the comparable calculated limit (s. NR 106.05(4), Wis. Adm. Code)
3. If fewer than 11 detected results are available, the mean effluent concentration exceeds 1/5 of the calculated limit (s. NR 106.05(6), Wis. Adm. Code)

Acute Limits based on 1-Q₁₀

Daily maximum effluent limitations for toxic substances are based on the acute toxicity criteria (ATC), listed in ch. NR 105, Wis. Adm. Code. Previously daily maximum limits for toxic substances were calculated as two times the ATC. However, changes to ch. NR 106, Wis. Adm. Code (September 1, 2016) require the Department to calculate acute limitations using the same mass balance equation as used for other limits along with the 1-Q₁₀ receiving water low flow to determine if more restrictive effluent limitations are needed to protect the receiving stream from discharges which may cause or contribute to an exceedance of the acute water quality standards.

$$\text{Limitation} = \frac{(\text{WQC}) (Q_s + (1-f) Q_e) - (Q_s - f Q_e) (C_s)}{Q_e}$$

Where:

WQC = Acute toxicity criterion or secondary acute value according to ch. NR 105

Q_s = average minimum 1-day flow which occurs once in 10 years (1-day Q₁₀)

if the 1-day Q₁₀ flow data is not available = 80% of the average minimum 7-day flow which occurs once in 10 years (7-day Q₁₀).

Q_e = Effluent flow (in units of volume per unit time) as specified in s. NR 106.06(4)(d), Wis. Adm. Code.

f = Fraction of the effluent flow that is withdrawn from the receiving water, and

C_s = Background concentration of the substance (in units of mass per unit volume) as specified in s. NR 106.06(4)(e), Wis. Adm. Code.

Attachment #1

As a rule of thumb, if the receiving water is effluent dominated under low stream flow conditions, the 1-Q₁₀ method of limit calculation produces the most stringent daily maximum limitations and should be used while making reasonable potential determinations. This is not the case for Green Lake and the limits are set based on two times the acute toxicity criteria.

The following tables list the calculated water quality-based effluent limitations for this discharge along with the results of effluent sampling for all the detected substances. All concentrations are expressed in terms of micrograms per Liter (µg/L), except for hardness and chloride (mg/L).

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)

RECEIVING WATER FLOW = 3.52 cfs, (1-Q₁₀ (estimated as 80% of 7-Q₁₀)), as specified in s. NR 106.06 (3) (bm), Wis. Adm. Code.

SUBSTANCE	REF. HARD.* mg/L	ATC	MEAN BACK-GRD.	MAX. EFFL. LIMIT**	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P ₉₉	1-day MAX. CONC.
Arsenic		340		680	136	<2.2		
Cadmium	397	50.1	0.02	100	20.0	<0.19		
Chromium	301	4446	0.79	8892	1778	<0.83		
Copper	397	57.0	0.15	114			14	
Lead	356	365	0.94	729	146	<4.3		
Nickel	268	1080		2160	432	2.10		
Zinc	333	345	5.75	689	138	23.0		
Chloride (mg/L)		757	36.0	1514			673	620

* The indicated hardness may differ from the effluent hardness because the effluent hardness exceeded the maximum range in ch. NR 105, Wis. Adm. Code, over which the acute criteria are applicable. In that case, the maximum of the range is used to calculate the criterion.

** The 2 × ATC method of limit calculation yields a more restrictive limit than consideration of ambient concentrations and 1-Q₁₀ flow rates per the changes to s. NR 106.07(3), Wis. Adm. Code, effective 09/01/2016.

Weekly Average Limits based on Chronic Toxicity Criteria (CTC)

RECEIVING WATER FLOW = 1.10 cfs (¼ of the 7-Q₁₀), as specified in s. NR 106.06 (4) (c), Wis. Adm. Code

SUBSTANCE	REF. HARD.* mg/L	CTC	MEAN BACK-GRD.	WEEKLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P ₉₉
Arsenic		152.2		369	73.7	<2.2	
Cadmium	175	3.82	0.02	9.23	1.8	<0.19	
Chromium	231	261.80	0.79	633	126.6	<0.83	
Copper	231	21.15	0.15	51.0			8.4
Lead	231	62.76	0.94	150.7	30.1	<4.3	
Nickel	231	105.79		256	51.2	2.10	
Zinc	231	249.9	5.75	597.0	119.4	23	
Chloride (mg/L)		395	36.0	905			519

* The indicated hardness may differ from the receiving water hardness because the receiving water hardness exceeded the maximum range in ch. NR 105, Wis. Adm. Code, over which the chronic criteria are applicable. In that case, the maximum of the range is used to calculate the criterion.

Monthly Average Limits based on Wildlife Criteria (WC)

The effluent characterization did not include any effluent sampling results for substances for which Wildlife Criteria exist.

Monthly Average Limits based on Human Threshold Criteria (HTC)

RECEIVING WATER FLOW = 5.37 cfs (¼ of Harmonic Mean), as specified in s. NR 106.06 (4), Wis. Adm. Code.

SUBSTANCE	HTC	MEAN BACK- GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Cadmium	370	0.02	2940	587.9	<0.19
Chromium (+3)	3818000	0.79	30330000	6067000	<0.83
Lead	140	0.94	1106	221	<4.3
Nickel	43000		340000	68000	2.1

Monthly Average Limits based on Human Cancer Criteria (HCC)

RECEIVING WATER FLOW = 5.37 cfs (¼ of Harmonic Mean), as specified in s. NR 106.06 (4), Wis. Adm. Code.

SUBSTANCE	HCC	MEAN BACK- GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Arsenic	13.3		106	21.1	<2.2

In addition to evaluating the need for limits for each individual substance for which HCC exist, s. NR 106.06(8), Wis. Adm. Code, requires the evaluation of the cumulative cancer risk. Because no effluent limits are needed based on HCC, determination of the cumulative cancer risk is not needed per s. NR 106.06(8), Wis. Adm. Code.

Conclusions and Recommendations: Based on a comparison of the effluent data and calculated effluent limitations, effluent limitations are not required for any toxic substances in this section.

Mercury – The permit application did not require monitoring for mercury because the Green Lake WWTF is categorized as a minor facility as defined in s. NR 200.02(8), Wis. Adm. Code. In accordance with s. NR 106.145(3)(a)3., Wis. Adm. Code, a minor municipal discharger shall monitor, and report results of influent and effluent mercury monitoring once every three months if, “there are two or more exceedances in the last five years of the high-quality sludge mercury concentration of 17 mg/kg specified in s. NR 204.07(5).” A review of the past five years of sludge characteristics data reveals that all the sample results are within expected analytical ranges and well below the 17 mg/kg level, except for one sample that was 32 mg/kg on 04/21/2016. The average concentration in the sludge from 08/11/2015 to 08/15/2019 was 6.87 mg/kg. Therefore, no mercury monitoring is recommended at Outfall 001.

PART 3 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR AMMONIA NITROGEN

The State of Wisconsin promulgated revised water quality standards for ammonia nitrogen in ch. NR 105, Wis. Adm. Code, effective March 1, 2004 which includes criteria based on both acute and chronic toxicity to aquatic life. Given the fact that the Green Lake WWTF does not currently have ammonia nitrogen limits, the need for limits is evaluated at this time.

Daily Maximum Limits based on Acute Toxicity Criteria (ATC):

Daily maximum limitations are based on acute toxicity criteria in ch. NR 105, Wis. Adm. Code, which are a function of the effluent pH and the receiving water classification. The acute toxicity criterion (ATC) for ammonia is calculated using the following equation.

$$\text{ATC in mg/L} = [A \div (1 + 10^{(7.204 - \text{pH})})] + [B \div (1 + 10^{(\text{pH} - 7.204)})]$$

Where:

A = 0.411 and B = 58.4 for a Warm Water Sport fishery, and
pH (s.u.) = that characteristic of the effluent.

The effluent pH data was examined as part of this evaluation. A total of 1645 sample results were reported from 07/01/2015 to 12/31/2019. The maximum reported value was 8.40 s.u. (Standard pH Units). The effluent pH was 7.90 s.u. or less 99% of the time. The 1-day P₉₉, calculated in accordance with s. NR 106.05(5), Wis. Adm. Code, is 7.90 s.u. and the mean plus the standard deviation multiplied by a factor of 2.33, an estimate of the upper ninety ninth percentile for a normally distributed dataset, is 7.89 s.u. Therefore, a value of 7.90 s.u. is believed to represent the maximum reasonably expected pH, and therefore most appropriate for determining daily maximum limitations for ammonia nitrogen. Substituting a value of 7.90 s.u. into the equation above yields an ATC = 10 mg/L.

Potential changes to daily maximum Ammonia Nitrogen effluent limitations:

Subchapter IV of ch. NR 106, Wis. Adm. Code (effective September 1, 2016) specifies methods for the use of the 1-Q₁₀ receiving water low flow to calculate daily maximum ammonia nitrogen limits if it is determined that the previous method of acute ammonia limit calculation (2×ATC) is not sufficiently protective of the fish and aquatic life. The more restrictive calculated limits shall apply.

The calculated daily maximum ammonia nitrogen effluent limits using the mass balance approach with the 1-Q₁₀ (estimated as 80 % of 7-Q₁₀) and the 2×ATC approach are shown below.

	Ammonia Nitrogen Limit mg/L
2×ATC	20
1-Q ₁₀	56

The 2×ATC method yields the most stringent limits for the Green Lake WWTF.

Presented below is a table of daily maximum limitations corresponding to the range of allowable effluent pH values. Use of this table is not necessarily recommended in the permit, but it is presented herein for informational purposes.

Daily Maximum Ammonia Nitrogen Limits

Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L
$6.0 \leq \text{pH} \leq 6.1$	108	$7.0 < \text{pH} \leq 7.1$	66	$8.0 < \text{pH} \leq 8.1$	14
$6.1 < \text{pH} \leq 6.2$	106	$7.1 < \text{pH} \leq 7.2$	59	$8.1 < \text{pH} \leq 8.2$	11
$6.2 < \text{pH} \leq 6.3$	104	$7.2 < \text{pH} \leq 7.3$	52	$8.2 < \text{pH} \leq 8.3$	9.4
$6.3 < \text{pH} \leq 6.4$	101	$7.3 < \text{pH} \leq 7.4$	46	$8.3 < \text{pH} \leq 8.4$	7.8
$6.4 < \text{pH} \leq 6.5$	98	$7.4 < \text{pH} \leq 7.5$	40	$8.4 < \text{pH} \leq 8.5$	6.4
$6.5 < \text{pH} \leq 6.6$	94	$7.5 < \text{pH} \leq 7.6$	34	$8.5 < \text{pH} \leq 8.6$	5.3
$6.6 < \text{pH} \leq 6.7$	89	$7.6 < \text{pH} \leq 7.7$	29	$8.6 < \text{pH} \leq 8.7$	4.4
$6.7 < \text{pH} \leq 6.8$	84	$7.7 < \text{pH} \leq 7.8$	24	$8.7 < \text{pH} \leq 8.8$	3.7
$6.8 < \text{pH} \leq 6.9$	78	$7.8 < \text{pH} \leq 7.9$	20	$8.8 < \text{pH} \leq 8.9$	3.1
$6.9 < \text{pH} \leq 7.0$	72	$7.9 < \text{pH} \leq 8.0$	17	$8.9 < \text{pH} \leq 9.0$	2.6

Weekly and Monthly Average Limits based on Chronic Toxicity Criteria (CTC)

Weekly and monthly average limits based on chronic toxicity criteria for ammonia are also calculated to determine the weekly and monthly average limits to meet the requirements of s. NR 106.07(3), Wis. Adm. Code.

Weekly average and monthly average limits for ammonia nitrogen are based on chronic toxicity criteria in ch. NR 105, Wis. Adm. Code.

The 30-day chronic toxicity criterion (CTC) for ammonia in waters classified as a Warm Water Sport Fish Community is calculated by the following equation, according to subchapter IV of NR 106, Wis. Adm. Code.

$$\text{CTC} = E \times \{ [0.0676 \div (1 + 10^{(7.688 - \text{pH})})] + [2.912 \div (1 + 10^{(\text{pH} - 7.688)})] \} \times C$$

Where:

pH = the pH (s.u.) of the receiving water,

E = 0.854,

C = the minimum of 2.85 or $1.45 \times 10^{(0.028 \times (25 - T))}$ – (Early Life Stages Present), or

C = $1.45 \times 10^{(0.028 \times (25 - T))}$ – (Early Life Stages Absent), and

T = the temperature (°C) of the receiving water – (Early Life Stages Present), or

T = the maximum of the actual temperature (°C) and 7 – (Early Life Stages Absent)

The 4-day criterion is equal to the 30-day criterion multiplied by 2.5. The 4-day criteria are used in a mass-balance equation with the 7-Q₁₀ (4-Q₃, if available) to derive weekly average limitations. And the 30-day criteria are used with the 30-Q₅ (estimated as 85% of the 7-Q₂ if the 30-Q₅ is not available) to derive monthly average limitations. The stream flow value is further adjusted to temperature; 100% of the flow is used if the Temperature ≥ 16 °C, 25% of the flow is used if the Temperature < 11 °C, and 50% of the flow is used if the Temperature ≥ 11 °C but < 16 °C.

Section NR 106.32 (3), Wis. Adm. Code, provides a mechanism for less stringent weekly average and monthly average effluent limitations when early life stages (ELS) of critical organisms are absent from the receiving water. This applies only when the water temperature is less than 14.5 °C, during the winter and spring months. Burbot, an early spawning species, are not believed to be present in the Puchyan River, based on conversations with local fisheries biologists. So “ELS Absent” criteria apply from

Attachment #1

October through March, and “ELS Present” criteria will apply from April through September for a warmwater sport fish classification.

Since minimal ambient data is available, the “default” basin assumed values are used for Temperature, pH and background ammonia concentrations, shown in the table below, with the resulting criteria and effluent limitations.

		Spring	Summer	Winter
		April & May	June – Sept.	Oct. - March
Effluent Flow	Qe (MGD)	3.52	3.52	3.52
Background Information	7-Q ₁₀ (cfs)	4.40	4.40	4.40
	7-Q ₂ (cfs)	10.0	10.0	10.0
	Ammonia (mg/L)	0.02	0.03	0.05
	Average Temperature (°C)	12	19	4
	Maximum Temperature (°C)	14	21	10
	pH (s.u.)	8.06	8.08	7.99
	% of Flow used	50	100	25
	Reference Weekly Flow (cfs)	2.2	4.4	1.1
	Reference Monthly Flow (cfs)	4.25	8.5	2.125
Criteria mg/L	4-day Chronic			
	Early Life Stages Present	5.60	3.66	
	Early Life Stages Absent			8.23
	30-day Chronic			
	Early Life Stages Present	2.24	1.46	
	Early Life Stages Absent			3.29
Effluent Limitations mg/L	Weekly Average			
	Early Life Stages Present	21.5	24.3	
	Early Life Stages Absent			19.9
	Monthly Average			
	Early Life Stages Present	14.4	17.2	
	Early Life Stages Absent			12.2

Effluent Data

The following table evaluates the statistics based upon ammonia data reported from 08/16/2018 to 06/27/2019, with those results being compared to the calculated limits to determine the need to include ammonia limits in the Green Lake permit for the respective month ranges. That need is determined by calculating 99th upper percentile (or P₉₉) values for ammonia during each of the month ranges and comparing the daily maximum values to the daily maximum limit. Based on this comparison, **ammonia nitrogen limits are not required for any month.**

Ammonia Nitrogen mg/L	April - May	June - September	October - March
1-day P ₉₉	5.3	4.1	1.4
4-day P ₉₉	2.9	2.4	0.8
30-day P ₉₉	1.55	1.03	0.34
Mean*	1.01	0.46	0.16
Std	1.08	0.98	0.32
Sample size	14	16	37
Range	0.025 – 3.4	0.027 – 4	0.025 – 1.9

*Values lower than the level of detection were substituted with a zero

PART 4 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR BACTERIA

On May 1, 2020, revisions to chs. NR 102 and NR 210, Wis. Adm. Code became effective which replace fecal coliform limits with new *Escherichia coli* (*E. coli*) limits for protection of recreational uses. Section NR 210.06(2)(a)1, Wis. Adm. Code, includes two limits which must be included in permits for facilities which are required to disinfect:

1. The geometric mean of *E. coli* bacteria in effluent samples collected in any calendar month may not exceed 126 counts/100 mL.
2. No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 counts/100 mL.

E. coli monitoring is recommended at the same frequency that fecal coliform monitoring is required in the current permit. Because Westfield's permit requires weekly monitoring, the 410 counts/100 mL limit will effectively function as a daily maximum limit unless the facility performs additional monitoring. Any additional monitoring beyond what is required by the permit must also be reported on the DMR as required in the standard requirements section of the permit.

These limits are required during May through September. No changes are recommended to the current recreational period and the required disinfection season.

Interim Limit

At this time, there is no effluent *E. coli* data available to determine if these limits are currently met. The permit will include a compliance schedule to meet these limits. During the compliance schedule, an interim limit applies to prevent back-sliding from the current level of disinfection during the compliance schedule period. Therefore, the current **fecal coliform limit shall be included in the reissued permit as an interim limit of 400 counts/100 mL as a monthly geometric mean**. Any weekly geometric mean limit which was included in the current permit for expression of limits purposes does not need to be included in the permit as an interim limit.

PART 5 – PHOSPHORUS

Technology Based Phosphorus Limit

Subchapter II of Chapter NR 217, Wis. Adm. Code, requires municipal wastewater treatment facilities that discharge greater than 150 pounds of Total Phosphorus per month to comply with a monthly average limit of 1.0 mg/L, or an approved alternative concentration limit.

Because Green Lake currently has a limit of 1.0 mg/L, this limit should be included in the reissued permit. This limit remains applicable unless a more stringent water quality-based concentration limit is given.

Water Quality-Based Effluent Limits (WQBEL)

Revisions to administrative rules regulating phosphorus took effect on December 1, 2010. These rule revisions include additions to ch. NR 102 (s. NR 102.06), which establish phosphorus standards for surface waters. Revisions to ch. NR 217 (s. NR 217, Subchapter III) establish procedures for determining WQBELs for phosphorus, based on the applicable standards in ch. NR 102.

The Department has developed a TMDL for the Upper Fox and Wolf River Basins which was approved by the US EPA in February 2020.

Section NR 217.16, Wis. Adm. Code, states that the Department may include a TMDL based limitation for phosphorus in addition to, or in lieu of, a s. NR 217.13 WQBEL in a WPDES permit. The UFWB TMDL establishes total phosphorus (TP) wasteload allocations (WLA) to reduce the loading in the entire watershed including WLAs to meet water quality standards for tributaries to the Upper Fox and Wolf River. Therefore, WLA-based WQBELs are protective of immediate receiving waters and TP WQBELs derived according to s. NR 217.13, Wis. Adm. Code are not required

TMDL Limits – Phosphorus

Total phosphorus (TP) effluent limits in lbs/day are calculated as recommended in the *TMDL Development and Implementation Guidance: Integrating the WPDES and Impaired Waters Programs* (April 2020) and are based on the annual phosphorus wasteload allocation (WLA) given in pounds per year. This WLA found in Appendix H of the *Total Maximum Daily Loads for Total Phosphorus and Total Suspended Solids in the Upper Fox and Wolf River Basins (UFWB TMDL)* report dated February 2020 are expressed as maximum annual loads (lbs/year). The annual WLA for Green Lake is 260 lbs/year.

For the reasons explained in the April 30, 2012 paper entitled *Justification for Use of Monthly, Growing Season and Annual Average Periods for Expression of WPDES Permit Limits for Phosphorus Discharges in Wisconsin*, WDNR has determined that the phosphorus WQBELs set equal to WLAs would not be consistent with the assumptions and requirements of the TMDL. Therefore, limits given to continuously discharging facilities covered by the UFW TMDL are given monthly average mass limits and, if the equivalent effluent concentration is less than or equal to 0.3 mg/L, six-month average mass limits are also included. The following equation shows the calculation of equivalent effluent concentration:

$$\begin{aligned}\text{TP Equivalent Effluent Concentration} &= \text{WLA} \div (\text{365 days/year} * \text{Flow Rate} * \text{Conversion Factor}) \\ &= 260 \text{ lbs/day} \div (\text{365 days/year} * \text{0.5 MGD} * \text{8.34}) \\ &= \text{0.17 mg/L}\end{aligned}$$

Since this value is less than 0.3 mg/L, both a six-month average mass limit and monthly mass limit are applicable for total phosphorus. The monthly average limit is set equal to three times the six-month average limit.

$$\begin{aligned}\text{TP Six-Month Average Permit Limit} &= \text{WLA} \div \text{365 day/year} * \text{multiplier} \\ &= 260 \text{ lbs/day} \div \text{365 days/year} * \text{1.22} \\ &= \text{0.869 lbs/day}\end{aligned}$$

$$\begin{aligned}\text{TP Monthly Average Permit Limit} &= \text{TP Six-Month Average Permit Limit} * \text{3} \\ &= \text{0.869 lbs/day} * \text{3} \\ &= \text{2.61 lbs/day}\end{aligned}$$

The multiplier used in the six-month average calculation was determined according to implementation guidance. A coefficient of variation (CV) was calculated, based on phosphorus mass monitoring data, to be 0.7. This was calculated by dividing the standard deviation of the phosphorus mass data by the average of the phosphorus mass data. However, it is believed that the optimization/construction of the wastewater

Attachment #1

treatment system to achieve the WLA-derived phosphorus permit limits will reduce effluent variability. Thus, the maximum anticipated coefficient of variation expected by any facility is 0.6. This value, along with the monitoring frequency, is used to select the multiplier. The current permit specifies phosphorus monitoring as 2/week. If a different monitoring frequency is used, the stated limits should be reevaluated.

Six-month average and monthly average mass effluent limits are recommended for this discharge. The limits are equivalent to a concentration of 0.208 mg/L and 0.626 mg/L respectively at the facility design flow of 0.5 MGD.

Since WLAs are expressed as annual loads (lbs/year), permits with TMDL-derived monthly average permit limits should require the permittee to calculate and report rolling 12-month sums of total monthly loads for TP. Rolling 12-month sums can be compared directly to the annual WLA.

Effluent Data

The following table summarizes effluent total phosphorus monitoring data from 07/01/2015 to 12/31/2019.

	Phosphorus mg/L	Phosphorus lbs/day
1-day P ₉₉	2.1	4.3
4-day P ₉₉	1.3	2.5
30-day P ₉₉	0.94	1.6
Mean	0.75	1.19
Std	0.40	0.85
Sample size	586	586
Range	0.04 – 5.2	0.05 – 12.8

Multi-Discharge Variance Interim Limit

With the permit application, Green Lake has applied for the phosphorus multi-discharger variance (MDV). Conditions of the phosphorus MDV require the facility to comply with an interim phosphorus limit in lieu of meeting the final WQBEL for this permit term. The recommended interim limit, pursuant to s. 283.16 (6) 1, Wis. Stats., is 0.8 mg/L as a monthly average. A compliance schedule may be appropriate to meet this interim limit, but compliance with 0.8 mg/L shall be no later than the end of the reissued permit.

Because Green Lake currently has an interim limit of 1.0 mg/L as a monthly average, this limit recommended to continue as the LCA.

PART 6 – TOTAL SUSPENDED SOLIDS

Total Suspended Solids (TSS) effluent limits in lbs/day are calculated as recommended in the *TMDL Development and Implementation Guidance: Integrating the WPDES and Impaired Waters Programs* (April 2020). This WLAs found in Appendix I of the *Total Maximum Daily Loads for Total Phosphorus and Total Suspended Solids in the Upper Fox and Wolf Basins (UFWB TMDL)* report dated February 2020 are expressed as maximum annual loads (lbs/year). The annual WLA for Green Lake is 26,916 lbs/year and the daily WLA is 74 lbs/day.

Attachment #1

Revisions to chs. NR 106 and 205, Wis. Adm. Code align Wisconsin's water quality-based effluent limits with 40 CFR 122.45(d), which requires WPDES permits contain the following concentration limits, whenever practicable and necessary to protect water quality:

- Weekly average and monthly average limitations for continuous discharges subject to ch. NR 210.
- Daily maximum and monthly average limitations for all other discharges.

The Green Lake Wastewater Treatment Facility is a municipal treatment facility and is therefore subject to weekly average and monthly average TSS limits derived from TSS annual WLAs.

$$\begin{aligned}\text{TSS Weekly Average Permit Limit} &= \text{Daily WLA} * \text{Weekly multiplier} \\ &= 74 \text{ lbs/day} * 2.37 \\ &= 175 \text{ lbs/day}\end{aligned}$$

$$\begin{aligned}\text{TSS Monthly Average Permit Limit} &= \text{Daily WLA} * \text{Monthly multiplier} \\ &= 74 \text{ lbs/day} * 1.59 \\ &= 118 \text{ lbs/day}\end{aligned}$$

The multiplier used in the weekly average and monthly average calculation was determined according to implementation guidance. A coefficient of variation was calculated, based on TSS mass monitoring data, to be 0.81. However, it is believed that the optimization of the wastewater treatment system to achieve the WLA-derived permit limits will reduce effluent variability. Thus, the maximum anticipated coefficient of variation expected by the facility is 0.6. This value, along with monitoring frequency, is used to select the multiplier. The current permit specifies TSS monitoring as 2/week; if a different monitoring frequency is used, the stated limits should be reevaluated.

Effluent Data

The following table summarizes effluent TSS monitoring data from 07/01/2015 to 12/31/2019.

	TSS mg/L	TSS lbs/day
1-day P ₉₉	7.8	16.7
4-day P ₉₉	4.9	9.5
30-day P ₉₉	3.11	5.74
Mean	2.31	4.12
Std	1.54	3.34
Sample size	468	416
Range	0.83 – 16	0.709 – 45.7

The effluent data from Green Lake shows that the facility can currently meet the TMDL-derived TSS limits, therefore a compliance schedule is not needed, and **the TMDL-derived limits should be effective upon permit reissuance. The current concentration limits are recommended to continue in the reissued permit as well to prevent backsliding.**

PART 7 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR THERMAL

Surface water quality standards for temperature took effect on October 1, 2010. These regulations are detailed in chs. NR 102 (Subchapter II – Water Quality Standards for Temperature) and NR 106 (Subchapter V – Effluent Limitations for Temperature) of the Wisconsin Administrative Code. Daily maximum and weekly average temperature criteria are available for the 12 different months of the year depending on the receiving water classification.

In accordance with s. NR 106.53(2)(b) , Wis. Adm. Code, the highest daily maximum flow rate for a calendar month is used to determine the acute (daily maximum) effluent limitation. In accordance with s. NR 106.53(2)(c) , Wis. Adm. Code, the highest 7-day rolling average flow rate for a calendar month is used to determine the sub-lethal (weekly average) effluent limitation. These values were based off actual flow reported from 07/01/2015 to 12/31/2019.

The table below summarizes the maximum temperatures reported during monitoring from 07/01/2011 to 06/30/2012.

Month	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Weekly Maximum	Daily Maximum	Weekly Average Effluent Limitation	Daily Maximum Effluent Limitation
	(°F)	(°F)	(°F)	(°F)
JAN	48	49	102	120
FEB	45	46	103	120
MAR	52	53	79	119
APR	54	56	70	120
MAY	55	60	78	113
JUN	65	67	96	113
JUL	67	69	109	120
AUG	68	69	106	101
SEP	66	68	91	106
OCT	61	64	80	120
NOV	54	56	75	120
DEC	51	53	99	120

Reasonable Potential

Permit limits for temperature are recommended based on the procedures in s. NR 106.56, Wis. Adm. Code.

- An acute limit for temperature is recommended for each month in which the representative daily maximum effluent temperature for that month exceeds the acute WQBEL. The representative daily maximum effluent temperature is the greater of the following:
 - (a) The highest recorded representative daily maximum effluent temperature
 - (b) The projected 99th percentile of all representative daily maximum effluent temperatures

Attachment #1

- A sub-lethal limitation for temperature is recommended for each month in which the representative weekly average effluent temperature for that month exceeds the weekly average WQBEL. The representative weekly average effluent temperature is the greater of the following:
 - (a) The highest weekly average effluent temperature for the month.
 - (b) The projected 99th percentile of all representative weekly average effluent temperatures for the month

Based on the available effluent data, no effluent limits are recommended for temperature. The complete thermal table is in Attachment #2.

PART 8 – WHOLE EFFLUENT TOXICITY (WET)

WET testing is used to measure, predict, and control the discharge of toxic materials that may be harmful to aquatic life. In WET tests, organisms are exposed to a series of effluent concentrations for a given time and effects are recorded. Decisions below related to the selection of representative data and the need for WET limits were made according to ss. NR 106.08 and 106.09, Wis. Adm. Code. WET monitoring frequency and toxicity reduction evaluation (TRE) recommendations were made using the best professional judgment of staff familiar with the discharge after consideration of the guidance in the WET Program Guidance Document (October 29, 2019).

- Acute tests predict the concentration that causes lethality of aquatic organisms during a 48 to 96-hour exposure. To assure that a discharge is not acutely toxic to organisms in the receiving water, WET tests must produce a statistically valid LC₅₀ (Lethal Concentration to 50% of the test organisms) greater than 100% effluent, according to s. NR 106.09 (2) (b), Wis. Adm Code.
- Chronic tests predict the concentration that interferes with the growth or reproduction of test organisms during a seven-day exposure. To assure that a discharge is not chronically toxic to organisms in the receiving water, WET tests must produce a statistically valid IC₂₅ (Inhibition Concentration) greater than the instream waste concentration (IWC), according to s. NR 106.09 (3) (b), Wis. Adm Code. The IWC is an estimate of the proportion of effluent to total volume of water (receiving water + effluent). The IWC of 41% shown in the WET Checklist summary below was calculated according to the following equation, as specified in s. NR 106.03(6), Wis. Adm Code:

$$\text{IWC (as \%)} = Q_e \div \{(1 - f) Q_e + Q_s\} \times 100$$

Where:

Q_e = annual average flow = 0.5 MGD = 0.774 cfs

f = fraction of the Q_e withdrawn from the receiving water = 0

Q_s = $\frac{1}{4}$ of the $7-Q_{10}$ = 4.40 cfs \div 4 = 1.1 cfs

- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), receiving water must be used as the dilution water and primary control in chronic WET tests, unless the use of different dilution water is approved by the Department prior to use. The dilution water used in WET tests conducted on Outfall 001 shall be a grab sample collected from the receiving water location, upstream and out of the influence of the mixing zone and any other known discharge. The specific receiving water location must be specified in the WPDES permit.
- Shown below is a tabulation of all available WET data for Outfall 001. Efforts are made to ensure that decisions about WET monitoring and limits are made based on representative data, as specified in s. NR 106.08 (3), Wis. Adm Code. Data which is not believed to be representative of the discharge was not

included in reasonable potential calculations. The table below differentiates between tests used and not used when making WET determinations.

WET Data History

Date Test Initiated	Acute Results LC ₅₀ % (% survival in 100% effluent)				Chronic Results IC ₂₅ %				Footnotes or Comments
	<i>C. dubia</i>	Fathead minnow	Pass or Fail?	Used in RP?	<i>C. dubia</i>	Fathead Minnow	Pass or Fail?	Use in RP?	
04/29/1997	>100	>100	Pass	Yes	57.9		-	No	1
04/21/1998	>100	>100	Pass	Yes					
07/15/2010	>100	>100	Pass	No	>100	100	Pass	No	2
02/15/2011	>100	>100	Pass	No	>100	>100	Pass	No	2
07/23/2013	>100	>100	Pass	Yes	>100	>100	Pass	Yes	

Footnotes:

1. *Qualified or Inconclusive Data.* Data quality concerns were noted during testing which calls into question the reliability of the test results.
 2. *Tests done by S-F Analytical, July 2008 – March 2011.* The DNR has reason to believe that WET tests completed by SF Analytical Labs from July 2008 through March 31, 2011 were not performed using proper test methods. Therefore, WET data from this lab during this period has been disqualified and was not included in the analysis.
- According to s. NR 106.08, Wis. Adm. Code, WET reasonable potential is determined by multiplying the highest toxicity value that has been measured in the effluent by a safety factor, to predict the likelihood (95% probability) of toxicity occurring in the effluent above the applicable WET limit. The safety factor used in the equation changes based on the number of toxicity detects in the dataset. The fewer detects present, the higher the safety factor, because there is more uncertainty surrounding the predicted value. WET limits must be given, according to s. NR 106.08(6), Wis. Adm. Code, whenever the applicable Reasonable Potential equation results in a value greater than 1.0.

$$\text{Acute Reasonable Potential} = [(TUa \text{ effluent}) (B)(AMZ)]$$

$$\text{Chronic Reasonable Potential} = [(TUC \text{ effluent}) (B)(IWC)]$$

According to s. NR 106.08(6)(d), Wis. Adm. Code, TUa and TUC effluent values are equal to zero whenever toxicity is not detected (i.e. when the LC₅₀, IC₂₅ or IC₅₀ ≥ 100%).

Acute Reasonable Potential = 0 < 1.0, reasonable potential is not shown, and a limit is not required.

Chronic Reasonable Potential = 0 < 1.0, reasonable potential is not shown, and a limit is not required.

The WET Checklist was developed to help DNR staff make recommendations regarding WET limits, monitoring, and other related permit conditions. The Checklist indicates whether acute and chronic WET limits are needed, based on requirements specified in s. NR 106.08, Wis. Adm. Code. The Checklist steps the user through a series of questions, assesses points based on the potential for effluent toxicity, and suggests monitoring frequencies based on points accumulated during the Checklist analysis. As toxicity potential increases, more points accumulate, and more monitoring is recommended to ensure that toxicity is not occurring. A summary of the WET Checklist analysis completed for this permittee is shown in the table below. Staff recommendations based on best professional judgment are provided below the summary table. For guidance related to reasonable potential and the WET Checklist, see Chapter 1.3 of the WET Guidance Document: <http://dnr.wi.gov/topic/wastewater/WETguidance.html>.

Attachment #1
WET Checklist Summary

	Acute	Chronic
AMZ/IWC	Not Applicable. 0 Points	IWC = 41%. 10 Points
Historical Data	3 tests used to calculate RP. No tests failed. 0 Points	1 test used to calculate RP. No tests failed. 0 Points
Effluent Variability	Little variability, no violations or upsets, consistent WWTF operations. 0 Points	Same as Acute. 0 Points
Receiving Water Classification	Warmwater sport fish 5 Points	Same as Acute. 5 Points
Chemical-Specific Data	No limits for substances based on ATC; ammonia, chloride, copper, nickel, and zinc detected. Additional Compounds of Concern: None 3 Points	No limits for substances based on CTC; ammonia, chloride, copper, nickel, and zinc detected. Additional Compounds of Concern: None 3 Points
Additives	0 Biocides and 1 Water Quality Conditioners added. P treatment chemical other than Ferric Chloride (FeCl), Ferrous Sulfate (FeSO ₄), or alum used: No 1 Points	All additives used more than once per 4 days. 1 Point
Discharge Category	No Industrial Contributors. 0 Points	Same as Acute. 0 Points
Wastewater Treatment	Secondary or better 0 Points	Same as Acute. 0 Points
Downstream Impacts	No impacts known 0 Points	Same as Acute. 0 Points
Total Checklist Points:	9 Points	19 Points
Recommended Monitoring Frequency (from Checklist):	No tests required	No tests required
Limit Required?	No	No
TRE Recommended? (from Checklist)	No	No

- After consideration of the guidance provided in the Department's WET Program Guidance Document (2019), no WET testing is recommended because the potential for effluent toxicity is believed to be very low.

Attachment #3

Temperature limits for receiving waters with unidirectional flow

(calculation using default ambient temperature data)

Facility:	Green Lake WWTF	7-Q₁₀:	4.40 cfs	Temp Dates		Flow Dates	
Outfall(s):	001	Dilution:	25%	Start:	07/01/11	07/01/15	
Date Prepared:	01/23/2020	f:	0	End:	06/30/12	12/31/19	
Design Flow (Q_e):	0.50 MGD	Stream type:	Small warm water sport or forage fish co ▼				
Storm Sewer Dist.	0 ft	Qs:Q_e ratio:	1.4 :1				
		Calculation Needed?	YES				

Month	Water Quality Criteria			Receiving Water Flow Rate (Qs) (cfs)	Representative Highest Effluent Flow Rate (Qe)		f	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Ta (default)	Sub-Lethal WQC	Acute WQC		7-day Rolling Average (Qesl)	Daily Maximum Flow Rate (Qea)		Weekly Average	Daily Maximum	Weekly Average Effluent Limitation	Daily Maximum Effluent Limitation
	(°F)	(°F)	(°F)		(MGD)	(MGD)		(°F)	(°F)	(°F)	(°F)
JAN	33	49	76	4.40	0.215	0.251	0	48	49	102	120
FEB	34	50	76	4.40	0.214	0.234	0	45	46	103	120
MAR	38	52	77	4.40	0.371	0.664	0	52	53	79	119
APR	48	55	79	4.40	0.329	0.404	0	54	56	70	120
MAY	58	65	82	4.40	0.387	0.558	0	55	60	78	113
JUN	66	76	84	4.40	0.349	0.445	0	65	67	96	113
JUL	69	81	85	4.40	0.300	0.316	0	67	69	109	120
AUG	67	81	84	4.40	0.406	0.699	0	68	69	106	101
SEP	60	73	82	4.40	0.517	0.646	0	66	68	91	106
OCT	50	61	80	4.40	0.419	0.492	0	61	64	80	120
NOV	40	49	77	4.40	0.244	0.265	0	54	56	75	120
DEC	35	49	76	4.40	0.197	0.246	0	51	53	99	120

